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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/510,599	03/18/2005	Michel Lecomte	20513-00607-US	1793
30678 7590 03/15/2010 CONNOLLY BOVE LODGE & HUTZ LLP 1875 EYE STREET, N.W. SUITE 1100 WASHINGTON, DC 20006				
EXAMINER				
MONDT, JOHANNES P				
ART UNIT		PAPER NUMBER		
3663				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/510,599

**Applicant(s)**

LECOMTE, MICHEL

**Examiner**

JOHANNES P. MONDT

**Art Unit**

3663

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 November 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 22-31 is/are pending in the application.
- 4a) Of the above claim(s) 23 and 24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 22 and 25-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

## DETAILED ACTION

### *Response to Amendment*

1. Amendment filed 11/18/09 forms the basis for this action. Applicant substantially amended all previously pending, elected claims 22 and 25-31. Comments on remarks submitted with said Amendment are included below under "Response to Arguments".

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 22, 25, 27, 29 and 31** are rejected under 35 U.S.C. 102(b) as being anticipated by Koutz (previously cited). Koutz teaches (see Figure and col. 2, l. 16 – col. 4, l. 51):

a device for producing electricity from heat produced in a core of a nuclear reactor (see title and abstract) comprising:

a primary circuit 14 (col. 2, l. 34-44) including helium (col. 2, l. 39) and circulating the helium to cool the core of the nuclear reactor;

an electric motor 50 inherently capable of functioning and hence being an electric generator if not driven (col. 3, l. 27-30) (N.B.: applicant is reminded of the definition of electric motor as being a device that converts electrical energy into mechanical energy using forces exerted by magnetic fields on current-carrying conductors (see, e.g.,

Cleveland et al, "Dictionary of Energy", first edition 2006, ISBN 0-080-44578-0; page 134 for a definition of "electric motor"), while according to Faraday's Law (see Smythe, "Static and Dynamic Electricity", McGraw-Hill, New York, second edition (1950), pp. 307-308, especially equation 3) on which this conversion is exclusively based a change in magnetic field per unit time equals a rotational electric field *vice versa*;

a drive shaft (shaft of 34) (col. 3, l. 27-30) driving the electric generator 50;  
a gas turbine 34 (col. 3, l. 2-4 and l. 45-49) driving the drive shaft;  
the drive shaft being common to the electric generator 50 and the gas turbine (Figure), and col. 3, l. 27-30);

a secondary circuit 22 (col. 2, l. 45-49) including a mixture of helium and nitrogen (col. 2, l. 45-49), the secondary circuit circulating the mixture of helium and nitrogen (loc.cit.), the gas turbine (34) driven by the mixture of helium and nitrogen in the secondary circuit (loc.cit.);

a heat exchanger 20 (col. 2, l. 38-44) connected to the primary circuit and secondary circuit and exchanging heat from the helium of the primary circuit to the mixture of helium and nitrogen in the secondary circuit (loc.cit.); and

a tertiary circuit ("steam loop": col. 3, l. 13-30) including water and steam, the tertiary circuit circulating the water ("Feedwater Supply": see Figure) and the steam ("STEAM": see Figure), the tertiary circuit including a steam generator 38 (col. 3, l. 18) and a steam turbine 46 (col. 3, l. 23+), the steam generator receiving the water at an inlet (its upper end in the Figure) and providing the steam at an outlet (its lower end in the Figure), the steam driving the steam turbine (46), the steam generator (38)

connected to the secondary circuit downstream of the gas turbine (see arrow in Figure), and being heated by the mixture of helium and nitrogen in the secondary circuit (col. 3, l. 30-37).

On claim 25: the tertiary circuit includes a further heat exchanger 54 (col. 3, l. 31-37) downstream from the steam generator (see arrow in Figure), the further heat exchanger *capable of* receiving wet steam from the steam turbine (46) (Examiner Note: "wet" and "dry" in "wet steam" and "dry steam" are relative terms or terms of degree: certainly, the steam is received in said heat exchanger in wetter form that it exits because of the heating from 500 F to 1,000 F: see col. 3, l. 31-37), the further heat exchanger (in use) being heated by the mixture of helium and nitrogen in the secondary circuit (22) thereby *capable of* converting the wet steam to dry steam. Applicant is reminded that in reference to intended use and other types of functional language must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963). In the underlying case, the capability of receiving wet steam and the capability of converting the wet steam are ensured by the combination of input in the form of feed water and the effect of temperature increasing due to heating to about 1,000 F, respectively, because the heating of feed water produces some steam inherently, while the heating of wet steam to 1,000 F reduces inherently the water droplet content of the steam.

*On claim 27:* the device by Koutz further comprises a counter-current heat exchanger 44 (col. 3, l. 20-27) [Examiner Note: "counter-current" because the currents each have a counter-direction in the frame of the other circuit] *capable of* exchanging heat from (the) mixture of helium and nitrogen in the secondary circuit to the tertiary circuit. Said capability follows from the direct connection of 44 with heat exchanger 24 thus ensuring the capability of exchanging heat between the secondary and tertiary circuits as claimed. Applicant is reminded that intended use and other types of functional language must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963).

*On claim 29:* the secondary circuit includes a compressor 26 (col. 2, l. 45-62) *capable of* pressurizing the mixture of nitrogen and helium of the secondary circuit to a pressure of the helium in the primary circuit. Applicant is reminded that intended use and other types of functional language must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963). In the underlying case, the selection of the pressure of the helium gas in the primary circuit is a matter of intended use. Given a given range of pressure to which the compressor 26 is capable of achieving there is a

selection of helium pressure that falls within said range, and hence said capability is ensured for possible intended use.

On *claim 31*: both the gas turbine (34) and the steam turbine (46) drive the drive shaft.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. ***Claim 26*** is rejected under 35 U.S.C. 103(a) as being unpatentable over Koutz (US 4,576,783) (previously made of record), in view of Kapich (US 4,413,348) (previously made of record). Koutz does not teach the tertiary circuit to include a further steam turbine driven by wet steam. However, Koutz does teach "other steam uses" at the end of the dry steam line emanating from the heat exchanger 54 (col. 3, l. 34-36), while it would have been obvious to exploit said dry steam through the use of a steam turbine, as disclosed, for instance, by Kapich et al, who, in a patent on exploiting heat

from a high-temperature gas-cooled nuclear reactor (title and abstract), hence art analogous to Koutz (see Koutz, title and abstract), teach the exploitation of steam to drive an electrical generator 52 (col. 3, l. 53-61 and Figure). The claim limitation thus is clearly obvious as nothing more is involved than combining prior art elements according to known methods to yield results that are entirely predictable. MPEP 2141.

6. **Claim 28** is rejected under 35 U.S.C. 103(a) as being unpatentable over Koutz (US 4,576,783) (previously made of record), in view of Naito (US 4,714,593) (previously made of record).

As detailed above, Koutz anticipates claim 22. Koutz does not necessarily teach the heat exchanger (20) to be a plate exchanger. However, plate heat exchangers have long been in use in the thermal power industry, as witnessed for instance by Naito et al, who, in a patent on heat exchange technology (title, abstract and col. 1, l. 5 – col. 2, l. 26), hence analogous in this regard to Koutz, teach a plate exchanger as a possible embodiment for heat exchanger 60 (Figures 1B and 5; and col. 9, l. 40-60). Hence all of the components recited in claim 30 are known, the only difference being the combination of old elements into a single device. Thus, it would have been obvious to one of ordinary skill in the art to select a plate exchanger, for instance a plate-fin exchanger, for the intermediate heat exchanger, since the operation of the plate exchanger is in no way dependent upon the operation of the other components, - because heat exchange of fluids with a plate surface or a plate-fin structure is effective regardless the fluid, given the large surface area available for heat exchange with a surface and/or fin, and given that both fluids involved in the intermediate exchanger by



Naito are characterized with positive thermal conductivity. Given the exchange gas composition, and the sizable thermal diffusivities of the participating gases, the selection of a plate exchanger is obvious merely considering the large surface area over which the heat exchange takes place. Therefore, the claim would have been obvious because a person of ordinary skill has good reason (large surface area involved in the heat exchange) to pursue known options (including the tested plate exchanger or plate-fin exchanger) within his or her technical grasp. If this leads to the anticipated success, then it is likely the product not of innovation but of ordinary skill and common sense.

2. **Claim 30** is rejected under 35 U.S.C. 103(a) as being unpatentable over Koutz as applied to claim 22 in view of Strohmeyer, Jr. (US 3,507,747). As detailed above, claim 22 is anticipated by Koutz. Koutz does not necessarily teach the further limitation as defined by claim 30. However, it would have been obvious to include a valve connected to the primary circuit as well as to the secondary circuit in view of Strohmeyer Jr., who, in a patent on heat exchange apparatus from a nuclear reactor (see title, abstract and col.1), hence art analogous to Koutz, teaches to include a control valve 124 between primary and secondary circuits to equalize pressures in emergency conditions wherein the pressure difference between said primary and secondary loops is excessive (col. 12, l. 12-17 and Figure 2. The further limitation defined by claim 30 is thus seen to be obvious as being nothing more than a known, i.e., conventional, expedient to increase the safety of the nuclear power plant by including an emergency pressure equilibration means in the form of a valve. Reasonable expectation of success in forming the combination is ensured, since the inclusion of a valve in heat exchange

circulation loops of a nuclear reactor is obviously a well-known and well-tested low-tech adaptation. In conclusion, the limitation is obvious as nothing more than “combining prior art elements according to known methods to yield predictable results” is involved (see MPEP 2142).

### ***Response to Arguments***

Applicant's arguments filed 11/18/09 have been fully considered but they are not persuasive. In particular, based on the new claim language electric motor 50 meets the limitation “electric generator” because when non-driven by electricity its coupling through the drive shaft of gas turbine 34 driven generally in part, and when the electric motor of the heat pump is idle entirely by the working fluid in the secondary loop. See col. 2, l. 63 – col. 3, l. 12 and Figure. Therefore, when electric motor 50 is idle it functions as an electric generator. Nothing in the device structure prevents it from working with an idle electric motor driven instead by the gas turbine through the common shaft of 34 and 50. Therefore, in its substantially amended form Koutz et al still anticipates claims 22, 25, 27, 29 and 31.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHANNES P. MONDT whose telephone number is (571)272-1919. The examiner can normally be reached on 8:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack W. Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JOHANNES P MONDT/  
Primary Examiner, Art Unit 3663